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ABSTRACT

Processes that integrate the logical and participative dimensions of group decision making and problem solving are increasingly important to those responsible for the organizational development of educational systems. This paper describes a model (The Optimal Combination of Processes for Creative Problem Solving) that was designed to deal with a problem class believed greater in cognitive complexity than any dealt with before. This model was designed for the development of recommendations and plans intended to improve the effectiveness and administration of a state adult basic education program. Participants were unanimous in praising the group process employed. An appendix contains sample problem and solution identification worksheets. (Author/DS)

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SHARED DECISION PROCESSES IN PUBLIC EDUCATION

by

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I. INTRODUCTION

Because of the complex nature of the educational system and the diversity of interest which exists among its distinct and influential constituency, or claimants, the importance of rational processes for group decision making and problem solving in its design and operation is being recognized. In order to identify and direct effects at goals considered to be of prime importance by all relevant on and off campus groups (i.e., faculty, students, administrators, community, trustees, alumni, etc.), organizational claimant models are employed. These require that (1) all organizational claimants be identified, (2) the nature of each claim be specified, (3) measurable elements be defined for each claim, (4) predictions of the future pattern of these claimants be made in the context of the claimants' objectives, and (5) the impact of these predictions on organizational decisions be assessed (Cleland, 1974).

Many forces have caused the educational organization to become aware of its accountability to its claimants. Vocal minority groups do not always find education appropriately responsive to their needs and occasionally feel it necessary to take matters into their own hands to get results. Students, in turn, do not always find establishment authority as exercised in the government of the schools responsive to their needs, real as well as manufactured, and find that some kinds of results are more easily obtained by force. Parents raise questions about what and how well their children are learning, and finding answers evasive, frequently band together in neighboring groups in order to pressure their schools for answers and results. Taxpayers, witnessing a comparatively staggering increase in their taxes in recent years with neither discernible evidence of improved results nor clear explanations

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for what the expenditures are intended to accomplish, increasingly reward this lack of account by rejecting school tax levies. Local boards of education, feeling pressure mount from an aroused, diverse public demanding results, and holding them responsible, find themselves hard pressed to provide straightforward answers, let alone hold anyone accountable. Some teacher groups, finding pent-up feelings of powerlessness released through collective action and state laws which mandate the negotiation of working conditions, exhibit greater preoccupation with their working conditions than a commitment to the teaching task, and at the same time advance a position that, as professionals, they are accountable only to themselves for their actions.

Congressmen, legislators, and political leaders become frustrated after expending millions of dollars for specifically designated educational programs and then receiving in return little intelligible information about the results obtained beyond the fact that the funds are expended and that a substantial increase is requested for the next year's operation. Finally, school administrators, being the group most responsive to pressure by virtue of their vulnerable position, finding their powers of administrative control being consistently negotiated by others into smaller amounts, and having to reply increasingly upon good will and volunteered cooperation, discover that their positions strategically place them at the convergent point of nearly all these pressures (Browder, 1971).

A number of approaches, singly or employed with others, have been proposed in order to make schools more accountable. Such approaches include the development of greater management sophistication among educators, the use of educational program auditing, the development and implementation of defined levels of performance expectations, the utilization of an alternative form of education, or a quickening of institutional responsiveness through increased local participation and semi-autonomy (Barrow, 1970).

It is the latter approach in which group problem solving/decision making processes play a crucial role. Educational programs must provide relevance to students, meet the excellence required by staff, and be consistent with the levels of resource made available by the funding community. The design and implementation of such programs require administrators to include members of each group in a decision making/problem solving process appropriately suited to the simultaneous accomplishment of these ends.

II. EVOLUTION OF ORGANIZATIONAL DECISION MAKING/PROBLEM SOLVING PROCESSES

Organizational decision making/problem solving has evolved in ways which both parallel and complement the organizational development (OD) processes to which it is now intimately related. Initially, emphasis was placed on the logical, rational, or structural aspects of the decision making/problem solving activity. The early emphasis on rationality has, of course, continued to the present time, until there now exists a significant number of conceptually complex prescriptive frameworks.

Many of these frameworks developed around the notion of the system. A system, simply defined, is a set of objects together with relationships between the objects and between their attributes (Hall, 1956). The systems concept seeks to explain relationships between objects in a manner which permits close scrutiny of the objects as well as how they fit together into a whole system or a part of it. Usually, this explanation is performed by building and analyzing abstract models of the empirical world which represent the necessary and sufficient relationships of the items being considered. Specific systems analysis methods include input/output analysis, econometric models, benefit/cost analysis, the planning-programming budget system (PPBS), and mathematical programming. Explanation of each of these approaches falls beyond the scope of efforts here. Their significance, however, lies in the fact that they provide a larger variety of ways to view problems--alternative ways that are logical, systematic, comprehensive, and above all rational.

A second decision making/problem solving emphasis was concerned with the behavioral component of organizations. The interest here centered on obtaining appropriate levels of participation from those affected by the decision or problem solving for socio-political rather than technical reasons. In order to make practical, workable suggestions which can be utilized in improving the decision making processes in schools, the following five generalizations drawn from the vast literature on organizational decision making can be emphasized (Owens, 1970):

1. Effective participation by all claimants in meaningful organizational decisions does pay off.

2. Claimants do not want to be involved in every decision nor do they expect to be.

3. An important task of the administrator is to distinguish between the decisions in which claimants should be involved and those which should be handled in other ways.

4. The roles and functions of claimants in decision making can be varied according to the nature of the problem.

5. The points in the decision making process in which claimants are involved can be varied according to the nature of the problem. Ratsoy (1973) argues convincingly that participative managerial styles lead to increased supervisor effectiveness, teacher satisfaction, decreased student alienation, and improved student achi vement.

The third and most recent period of organizational decision making/problem solving thought is concerned with the natural integration of the crucial structural and behavioral dimensions in order to achieve an acceptable final state of affairs. Despite the widespread contemporary support for the principles of rationality and participation, relatively few specific mechanisms have been suggested for transforming these principles into a functional reality. The most common proposals for rational participation center on electing members of administrative committees or selecting them to represent constituency groups. Neither approach assures that the sentiments and interests of the group whose participation is desired will be correctly perceived, and integrated into the decision making. Clearly, the consultative activity is least likely to generate true participation and, conversely, most likely to end up a charade providing the form of participation without any substance. But, even the representative committee can fall short of effective participation. The committee's ability to represent its constituencies can be thwarted by the contraints of the committee's terms of reference and the style of the committee's chairman. Also, the committee members, once elected, may facilitate committee actions that can substantially vary from the interests supposedly being represented. Lacking in these systems are procedures which provide an information flow from the constituency to the decision makers in the form of opinions or preferences. In addition, the complexity of the information provided by a large claimant body requires some techniques for collecting their preferences and a format that will manage disruptive conflict among parties to the decision (Pollay, 1976); see Figure 1.

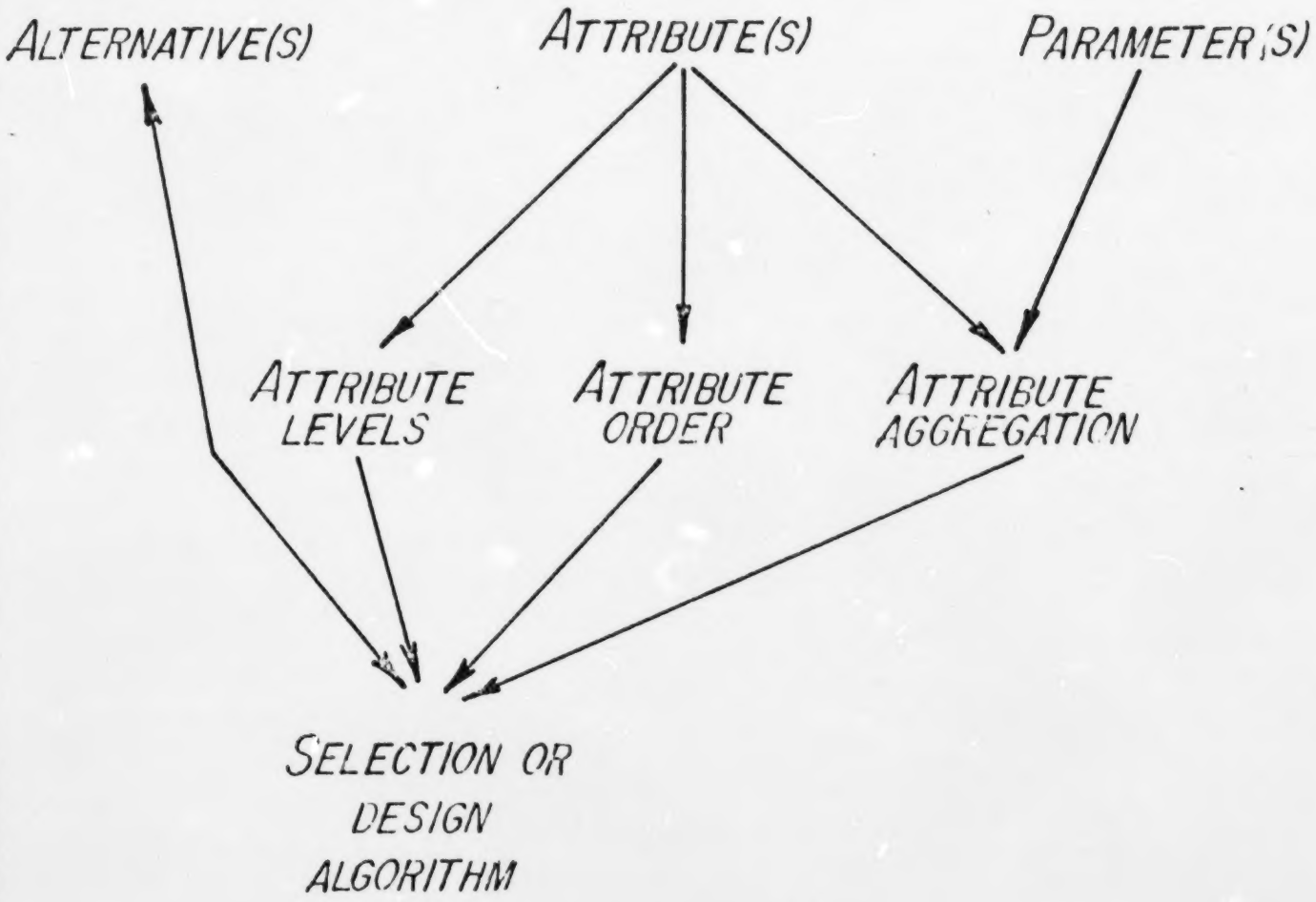

FIGURE 1. Selection Issue Elements

The structural and behavioral characteristics which should be considered in the design of an organizational group decision making/problem solving process will be next discussed.

III. PROCESS DESIGN

Process Type

A great deal of information on organizational group decision making/ problem solving processes already exists. Several considerations are particularly valuable in facilitating the understanding and utilization of this information. The first consideration deals with process type. Although various taxonomies also exist, I will deal with only the referent terminology, description of the process, and the general underlying thinking associated with the more significant process types. These processes include the interacting, the nominal, and the Delphi.

The interacting process refers to a conventional discussion group format which is generally an unstructured free-flowing meeting with minimal direction by the leader other than the presentation of the issue to the group. Obviously, a trained leader can create increasing degrees of structure in a discussion group so that an interacting group can approximate a structured group process. In this case, the term "interacting process" refers to an unstructured discussion group. Interacting groups play a very positive role with respect to increasing (1) group motivation and cohesion, (2) a sense of group consensus, and (3) the feeling that each alternative solution possibility has been carefully reviewed. Thus, for certain motivational purposes, the problems associated with an interacting group may far from cancel out its benefits.

The nominal group technique was developed by Delbecq and Van de Ven in 1968. It was derived from social-psychological studies of decision conferences, management science studies of the collection of group judgments, and social work studies surrounding citizen participation in program planning. Since that time, the nominal group technique has gained extensive recognition and has been widely applied in health, social service, education (Mosky and Green, 1974; Uhl, 1971; and Vroman, 1975), industry, and government organizations. The process includes a silent generation of ideas in writing, a round-robin feedback from group members to record each idea in a terse phrase on a flipchart, the discussion of each idea for clarification and evaluation, and the individual voting on the priority ideas leading to a group decision which is mathematically derived through rank ordering or rating. The technique overcomes a number of

critical problems typical of interacting groups. The silent independent generation of ideas followed by further thought and listening during the round-robin procedure results in a high quantity of ideas. The structured process forces equality of participation among members in generating information on the problem. The meetings tend to conclude with a perceived sense of closure, accomplishment, and interest in future phases of problem solving.

Unlike the typical interacting meeting or nominal group technique where close physical proximity of group members is required for decision making, the Delphi technique does not require that participants meet face to face. The Delphi technique is a method for the systematic solicitation and collation of judgments on a particular topic through a set of carefully designed sequential questionnaires interspersed with summarized information and feedback of opinions derived from earlier responses.

There are several characteristics of the Delphi process which facilitate decision making performance. The isolated generation of ideas in writing produces a high quantity of ideas. The process of writing responses to the questions forces respondents to think through the complexity of the problem and submit specific, high quality ideas. The amity and isolation of respondents provide freedom from the pressure to comform to group ideas. Simple pooling of independent ideas and judgments enhances the quality of participant contributions. The Delphi process tends to conclude with a moderately perceived sense of closure and accomplishment. Furthermore, the technique is valuable for obtaining judgments from geographically isolated experts.

It has become apparent to those conducting research in the area of group decision making and problem solving that no single process is generally superior to others. Rather, there are advantages and disadvantages to each. That is, depending on the circumstances, the constraints which exist, or the applicability of various structural or behavioral criteria (see Figure 2), different processes may be appropriate. Some processes enable the development of a better product with respect to its quality or quantity. Some processes enable a better identification of participants with the product. Others permit greater flexibility in time, while still others are less expensive to employ.

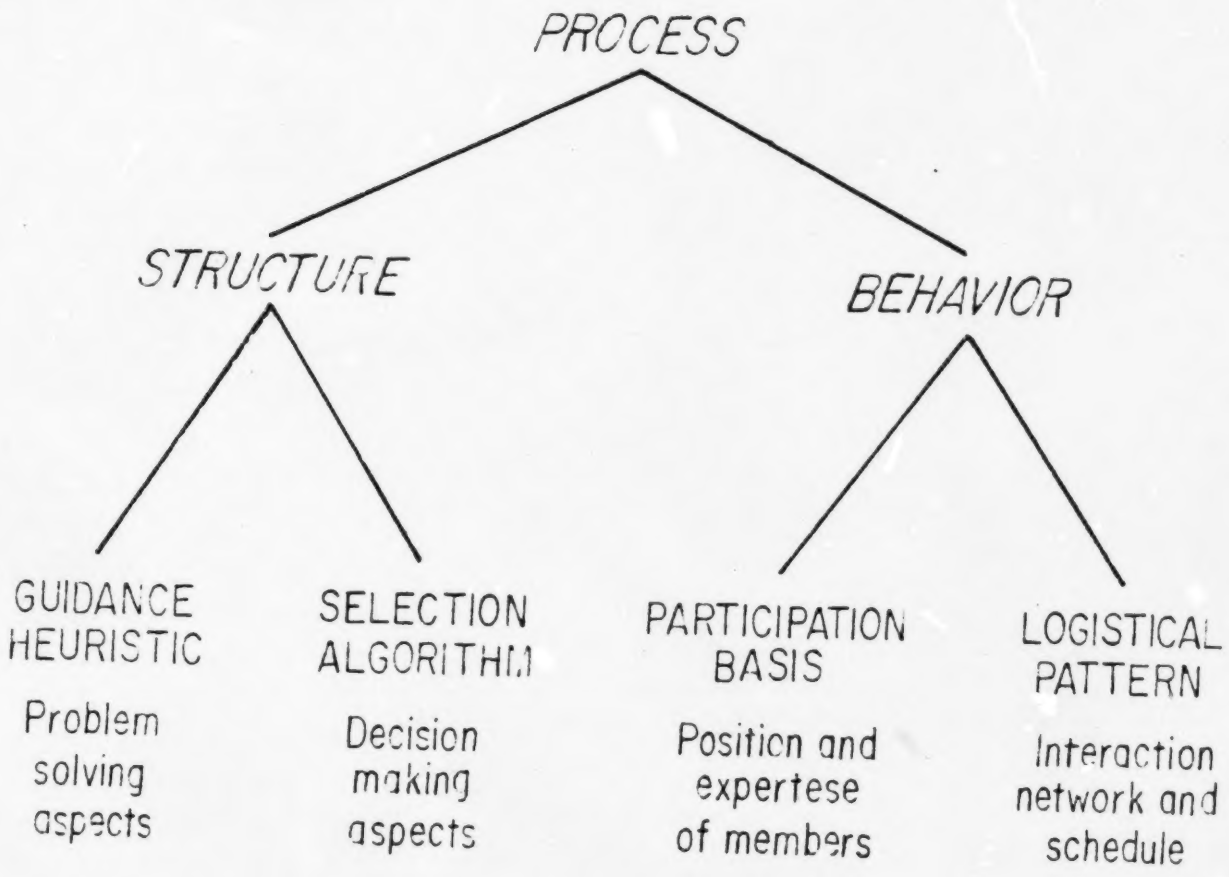

FIGURE 2. Design Considerations

Process Combinations

It has further become apparent that combinations of these processes can be employed which are more useful than any of the component processes used individually. Middendorf (1973) and Van de Ven and Delbecq (1971) concluded that different problem types and different group problem solving phases (fact-finding, idea generation, probability estimation, clarification, evaluation, and compromise) require different problem solving processes if problems are to be effectively dealt with, in terms of quality of outcome and nature of member interaction. Interactive (unstructured face-to-face behavior), nominal (individual silent effort in a group setting), and Delphic (anonymous use of sequential questionnaires) processes have been examined, modified, and combined in ways which produce high levels of group consensus and integration (Souder, 1974). Issues dealt with by groups in the conduct of such research have involved the development of consensus lists of R & D investment guidelines (Souder, 1974), program planning, (Delbecq and Van de Ven, 1974), and judgments involving the estimation of a parameter (Huber and Delbecq, 1972).

These various issues or problem types require the members of a group to engage in a decision making activity which requires them to elicit facts or opinions or to suggest the relevant considerations which should be taken into account in any subsequent application and problem resolution. The means by which the various considerations are combined or reduced is specified (as by ranking or rating) or is not relevant to the group's activity. An ability to make distinctions is required primarily for the selection of the most important considerations. Such problems require considerable ability to differentiate among dimensions of a problem or to recognize differences within a single dimension (Bieri et al., 1966), but little or none to integrate the problem dimensions; their overall "cognitive complexity," which is defined as combinations of these abilities, is consequently low to moderate in magnitude.

Multiattribute (or multiple attribute) and multiple objective decision problems, which are obviously those most often encountered in organizational operations, are by nature cognitively complex. They require of the decision makers attribute delineation, intra-attribute scaling, and inter-attribute

reconciliation, the degree of which is dependent upon the particular "multiple objective/multiple attribute decision method" employed (MacCrimmon, 1968); see Figure 3. Furthermore, a great deal of such organizational decision making and problem solving activity requires "personalistic involvement" of group members. This need becomes apparent when attempting to decide which theory to apply, in determining whether conditions of certainty or uncertainty are involved, and when making Hurwicz-type selection-parameter decisions. Questions involving array strategies, the number of measures of performance, and the value of weighting coefficients also make a "personalistic involvement" mandatory (Eilon, 1969). Educational institutions readily satisfy these cognitive-complexity-level requirements needed for extending the investigation of group processes further along the complexity continuum. Also, bringing organizational constituents into the behavioral laboratory is extremely difficult and expensive. For these reasons, investigations associated with educational program organization development efforts offer the most promising organization development efforts offer the most promising environment in which to conduct such research (Lindsay, 1976).

A final consideration and one which is interdependent with that involving the appropriate design of a process combination, is that of the nature of the membership participating in the decision making/problem solving process. This is of particular importance when constructing process combinations or participation of particular members is not necessary in each process phase.

An excellent example of this is that of the "Program Planning Model (PPM)," which divides program planning and development into five phases. While these phases are compatible with the scientific method, the program planning model suggests specific group techniques and specific roles for different interest groups at different phases in the process. The entire process may be briefly summarized as follows:

Phase 1 consists of problem exploration. It involves client or consumer groups and first-line supervisors.

Phase 2 consists of knowledge exploration. It involves external scientific personnel and internal and external organizational specialists.

SPECIFICATION FLOW CHART OF

MULTI-ATTRIBUTE DECISION-MAKING METHODS

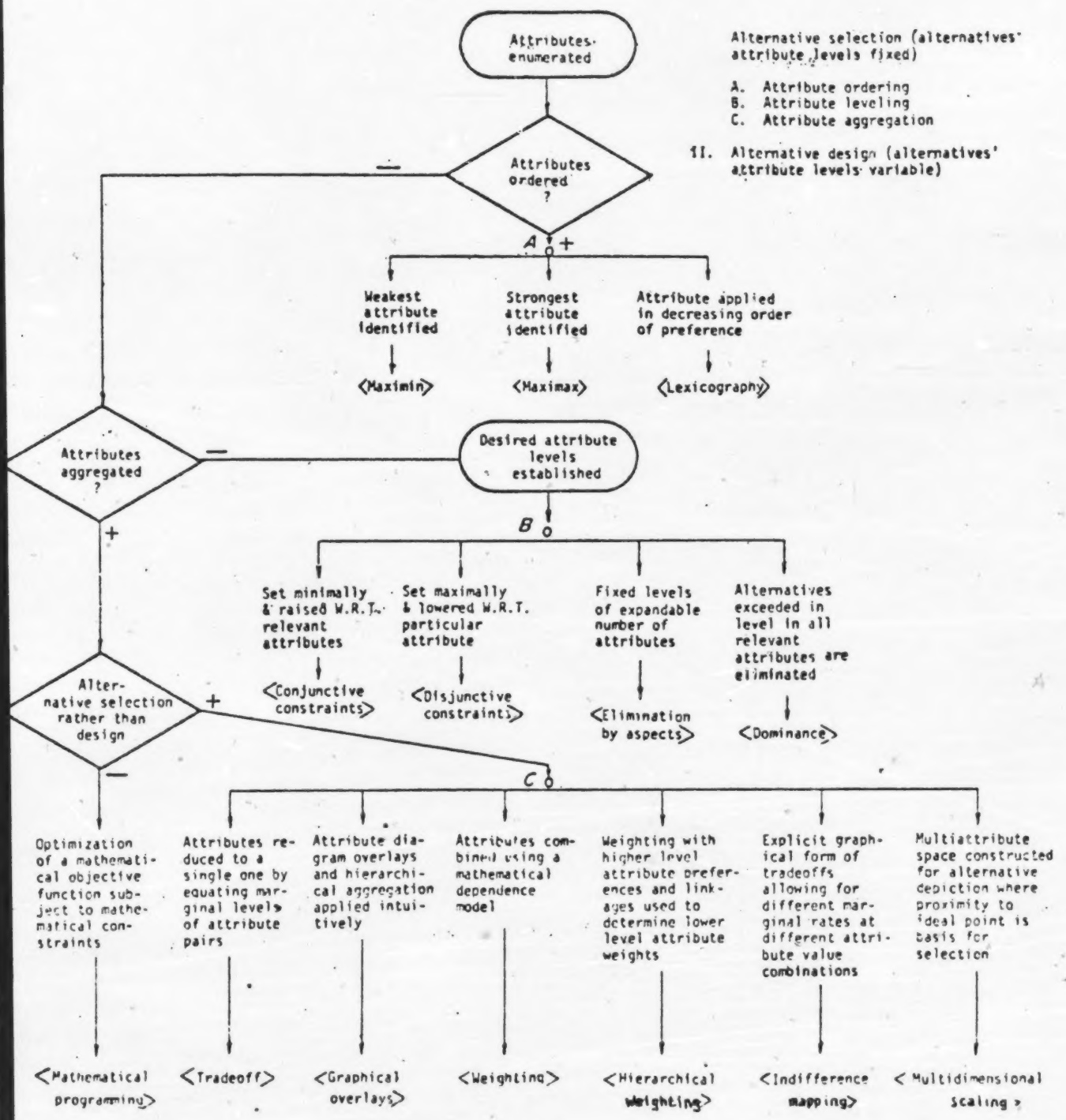

FIGURE 3

Phase 3 consists of priority development. It involves resource controllers and key administrators.

Phase 4 consists of program development. It involves line administrators and technical specialists. Finally,

Phase 5 consists of program evaluation. It involves client or consumer groups, staff and administrative personnel.

As described, the program planning method suggests a means by which internal exchange across organizational units and extra-organizational interfaces can be sequenced, and offers an explicit process for structuring the character of participation within each phase of the planning (Delbecq and Van de Ven, 1974).

IV. ABE PROGRAM OPERATIONS WORKSHOP

Background

The experimental setting involved a workshop to develop feasible recommendations and plans for improving the effectiveness and administration of ABE programs in Pennsylvania (Lindsay, 1976); as such it was concerned with the performance of a group of individuals engaged in a cognitively complex decision making or problem solving activity. The activity consisted of developing "action plans" (Odiorne, 1969) which by their nature are cognitively complex in that the group members are required to perform the following tasks:

1) Differentiate among dimensions of a problem; i.e., identify relevant problems, solution components, alternatives, and performance steps;
2) Discriminate by interpreting differences within and across dimensions; i.e., develop priorities for problems and alternatives generated; and
3) Integrate the various solution components into alternatives, and action steps into action plan units.

Two aspects of the group's performance were of interest--the group's problem solving ability itself and the intragroup climate which existed. The group was composed of individuals who are claimants to the Adult Basic Education organization and whose potential support of the problem solution could be as important a reason for their inclusion as was the technical or experiential expertise which they possessed.

The workshop was designed as an administrative field experiment (Thompson, 1974) based on observation, documents, and written instruments involving the group members and a panel of technical and organizational experts (Delbecq and Van de Ven) outside the group. It was conducted in a fashion consistent with the philosophy and objectives of the administrative experiment in which an administrator-experimenter attempts to accomplish both of the following:

1) Bring about some desired change or improvement in the present or future performance or operation of the organization (here, to solve a problem important to the ABE organization and one requiring endorsement by the contributors to the solution), and

2) Better understand or improve confidence in the relationship of the change introduced and the results achieved (here, to evaluate the effectiveness of an alternative form of group decision making and problem solving activity).

The subject problem of this study was timely in that considerable and relevant research exists concerning group decision making and problem solving and administrative experimentation (Evan, 1971 and Suchman, 1967). To date, research in both areas has not overlapped. Also, the author's experiences in numerous management and organization development programs indicated that the problem was practical in that it has been the source of considerable frustration to industrial and institutional organizations. Furthermore, it sharpened application of "the optimal combination of processes for creative problem solving" (Van de Ven and Delbecq, 1971) by making more operational the specification of the level the decision making or problem solving activity with which the group must deal. At the same time experimentation with group processes was extended to a problem class greater in cognitive complexity than any dealt with to date. Finally, it required a structural elaboration of the role of the monitor in a Delphic process from that of "one who carefully designs and administers questionnaires" (Turoff, 1970) to one who serves anonymously as a thinking-facilitator directing thought about a problem (Maier, 1970) and a bridge scientist serving to close any knowledge gap which exists between members of the group and the decision sciences. More specifically, the new role requires "resolving paradigm conflicts and mediating between different evaluational standards and problem solving approaches" (Anbar, 1973) by use of written instruments.

Workshop Process

A nominal group setting was employed to enable group members to familiarize themselves with certain evaluation survey data and to list what in their opinions constituted the most significant problems related to the assigned area under discussion in their workgroup. They were instructed not to limit themselves to problems stimulated by the survey data alone; rather, they were to bring all of their experiences (or the experiences of others that they were aware of) to bear on the ABE problem identification. After a round-robin listing,

an irteractive clarification of the problems elicited, and a nominal voting for the problems considered both most significant and tractable, another nominal session was conducted in which members were instructed to suggest solutions which could lead to a resolution of the problem at hand; these solution approach(es) were to be described in general terms only. Finally, a variety of group processes were employed to develop an action plan, describing the problem solution in terms of greater performance, cost, and schedule details, for each solution. The process employed is outlined in Figure 4 and typical work sheets used are provided in the Appendix.

For each of six evaluation-component areas, at least a dozen significant problems were identified. For each of the problems selected as worthy of being given first priority attention in each component area, at least a half-dozen general solution approaches were offered. The best elements of the solution approaches were finally synthesized into an action plan, again one for each component area. The action plans obtained were all quite substantial in detail, realism, and potential value to ABE. Program/group participants were unanimous in praising the group process approach employed and in recognizing the merit of the action plans developed. The project, of which this workshop was a part is more fully described in...ABE report (Lindsay, 1976).

ORGANIZATIONAL/GROUP DECISION-MAKING/PROBLEM-SOLVING PROCESS

PROBLEM EXPLORATION

Nominal listing, Round-Robin sharing, and Interactive clarification

PROBLEM PRIORITIZATION

Nominal ordering and Interactive reconcilation

{STARTING WITH TOP PRICRITY PROBLEM}

SOLUTION COMPONENT GENERATION

Nominal listing, Round-Robin sharing, and Inteactive clarification

SOLUTION COMPONENT SYNTHESIS---ALTERNATIVE CREATION

Nominal study, Round-Robin sharing, and Ineractive reconciliation

ALTERNATIVE PRIORITIZATION

Nominal ordering and Interactive reconciliation

{STARTING WITH TOP PRIORITY PROBLEM}

ACTION STEP GENERATION

Nominal listing, Round-Robin listing, and Interactive clarification

ACTION STEP SYNTHESIS

Nominal study, Round-Robin display, and Interactive reconciliation

ACTION STEP SCHEDULING AND BUDGETING

Nominal estimation, Round-Robin display, and Interactive reconciliation

RECYCLE

RECYCLE

FIGURE 4

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APPENDIX

1975-76 PENNSYLVANIA ABE ASSESSMENT PROJECT

ABE PROGRAM OPERATIONS WORKSHOP

Problem Identification Worksheet

WORKGROUP NO. _____ COMPONENT _____

Instructions: *In general terms, please list what, in your opinion, constitute the three most significant problems (or potential problems) related to the ABE evaluation component that is currently under discussion in your workgroup. Please do not limit yourself to problems stimulated by the survey data alone; rather, bring all of your experiences (or the experience of others that you are aware of) to bear on ABE problem identification.*

Problem Statement #1.

Problem Statement #2.

Problem Statement #3.

1975-76 PENNSYLVANIA ABE ASSESSMENT PROJECT

ABE PROGRAM OPERATIONS WORKSHOP

Solution Alternatives Worksheet

WORKGROUP NO. _____ COMPONENT_____

Instructions: *In the spaces provided below please suggest up to three solutions which could lead to resolution of the problem at hand. Please describe the solution approach(es) in general terms only.*

Solution Alternative #1.

Solution Alternative #2.

Solution Alternative #3.

1975-76 PENNSYLVANIA ABE ASSESSMENT PROJECT

ABE PROGRAM OPERATIONS WORKSHOP

Action Plan Worksheet

GROUP NO. _____ COMPONENT _____

Instructions: *At this point we are concerned with "fleshing out" the solution which, in the group's opinion, offers the most promise for resolving the operational problem. We would like you to adopt a "journalistic" approach in detailing an action plan (i.e., provide answers to the specific questions—who, what, why, when, where, how, etc.). Be as specific as you can but do not force yourself to provide answers or suggestions where you do not feel comfortable in doing so.*

Illustrative questions that might be addressed in considering the who, what, why, etc. have been provided. You should not feel obliged to answer every question nor should you consider the list to be exhaustive.

WHO?: [e.g., Who (person, level, agency) should initiate the action? Who is/are the decision makers? Who will be impacted upon as a result of implementation? Whose support, cooperation, or active participation is required? etc.]

WHAT?: [What steps must be taken? Must the sequence of steps be considered? Are there any identifiable milestones (delivery of products, progress checks, prerequisites, etc.) that need be considered?]

WHEN?: [What is a reasonable overall time frame for state-wide implementation at the local level? Can we determine when milestones could, would, or should occur?]

WHERE?: [At what level (local, state, federal) should the action be initiated, should the impact be felt, should decisions be made, should an action occur?]

WHY?: [How will overall program effectiveness be improved?]

HOW?: [Are there any suggestions that can be made regarding the "nuts and bolts" or mechanics of the action plan (e.g., conduct a survey, pilot test, evaluation, etc; draft materials, tests, curriculum plans, policy statements etc.; seek community, state or federal funds, etc.)?]